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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/559,832

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Fabrice Stassin

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EXAMINER

WINKLER, MELISSA A

ART UNIT

PAPER NUMBER

1796

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/559,832	<b>Applicant(s)</b> STASSIN ET AL.	
	<b>Examiner</b> MELISSA WINKLER	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |                                                                                      |                                                                   |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____                                                          | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 3** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Independent Claim 1 sets forth the clay and organomodifier are mixed in the presence of carbon dioxide. Claim 3 appears to contradict this, setting forth the clay and organomodifier are mixed before contact with carbon dioxide occurs.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1 – 4 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11092132 to Wada in view of US 6,821,464 to Okamoto et al. For convenience,

citations for Wada et al. are from the English-language abstract and Japanese Patent Office Machine Translation of the document.

**Regarding Claim 1.** Wada teaches a process for modifying an inorganic compound, such as montmorillonite. In this process, montmorillonite is mixed with an aqueous solution of quaternary ammonium ions. Carbon dioxide under a pressure of 10 – 20 MPA is also introduced (English-language abstract “Solution,” Lines 1 - 6).

Wada does not expressly teach solvents other than water may be used to prepare the solution of quaternary ammonium ions. However, Okamoto et al. also teach a method wherein a layered clay is modified with organic onium ions which may be dispersed in solvents, such as methanol or ethanol, instead of water (Column 6, Lines 48 – 58). Wada and Okamoto et al. are analogous art as they are from the same field of endeavor, namely methods of modifying laminar phyllosilicates with organic onium ions. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use one of the solvents taught by Okamoto et al. in place of water when preparing the quaternary ammonium ion solution taught by Wada. The motivation would have been that methanol, for example, has a lower boiling point than water and would thus require less heat to remove from the modified clay.

**Regarding Claim 2.** Wada teaches the process of Claim 1 wherein the carbon dioxide introduced is in a supercritical state (English-language abstract "Solution," Lines 5 - 6).

**Regarding Claim 3.** Wada teaches the process of Claim 1 wherein montmorillonite and an organomodifier, specifically quaternary ammonium ions, are mixed before carbon dioxide under pressure is introduced (English-language abstract "Solution," Lines 1 - 6).

**Regarding Claim 4.** Wada teaches the quaternary ammonium modifier used may be tetramethylammonium chloride, an alkylammonium salt (Machine Translated Detailed Description, Paragraph 16).

**Regarding Claim 9.** Wada teaches the process of Claim 1 wherein the carbon dioxide is at a pressure in the range of 10 – 20 MPa (100 – 200 bars) and a temperature in the range of 35 - 50°C (English-language abstract "Solution," Lines 5 - 6).

**Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11092132 to Wada in view of US 6,821,464 to Okamoto et al., as applied to Claims 1 and 4, and further in view of US 2,761,835 to Brown.

**Regarding Claim 5.** While Wada teaches the process of Claim 4 in which an alkylammonium salt is used, the claimed alkylammonium salts are not expressly

taught. However, Brown also teaches a method of modifying montmorillonite with substituted ammonium ions from a salt such as tetraethylammonium chloride (Column 2, Lines 33 –38; Column 3, Lines 58 – 61; Column 4, Lines 20 – 21, 35 – 36, and 52 - 53). Wada et al. and Brown are analogous art as they are from the same field of endeavor, namely processes for modifying montmorillonite and other similar compounds. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use tetraethylammonium chloride as the organomodifier in the process taught by Wada et al. The motivation would have been that tetraethylammonium chloride provides advantages such as improved mechanical strength and increased resistance to chemical attack to the clays it modifies (Brown, Column 3, Lines 58 – 62).

**Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11092132 to Wada in view of US 6,821,464 to Okamoto et al., as applied to Claim 1 above, and further in view of US 2002/0018951 to Livengood et al.

**Regarding Claim 6.** Wada teaches the process of Claim 1 wherein ammonium compounds are used as organomodifiers (Machine Translated Detailed Description, Paragraph 16). Wada does not expressly teach the ammonium compounds used are siliconated ammonium compounds. However, Livengood et al. also teach a composition in which the organomodifier used is an amino-terminated

poly(dimethylsiloxane) (Page 5, Paragraph 55 and Page 11, Paragraph 104). Wada and Livengood et al. are of the same technical difficulty, namely organic ammonium charge modifiers. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the amine-terminated poly(dimethylsiloxane) polymer taught by Livengood et al. as the modifier in the process taught by Wada. The motivation would have been that the modified poly(dimethylsiloxane) polymer taught by Livengood et al. can be used as a compatibilizing agent, facilitating the miscibility of polymers so that desired properties in the final product, such as thermal stability, are achieved.

**Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11092132 to Wada in view of US 6,821,464 to Okamoto et al., as applied to Claim 1 above, and further in view of US 5,069,994 to Gitzel et al.

**Regarding Claim 7.** Wada teaches the process of Claim 1 wherein ammonium compounds are used as organomodifiers (Machine Translated Detailed Description, Paragraph 16). Wada does not expressly teach the ammonium compounds used are highly fluorinated ammonium compounds. However, Gitzel et al. do teach the use of an intensely fluorinated ammonium compound as a charge modifier (Column 4, Line 36 – Column 5, Line 12). Though Gitzel et al. do not expressly disclose the claimed highly

fluorinated ammonium compound, Gitzel et al. do teach a variety of highly fluorinated compounds. One would consequently expect that one or more of these highly fluorinated compounds would function as an organomodifier in substantially the same way as the claimed fluorinated compound. Wada and Gitzel et al. are of the same technical difficulty, namely organic ammonium charge modifiers. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use a highly fluorinated ammonium compound as the organomodifier in the process taught by Wada et al. The motivation would have been that using a highly fluorinated ammonium compound as the organomodifier of the clay would provide advantages such as their ability to act as a positive or negative charge control agent so that the clay could suitably modified for mixing with assorted polymers (Gitzel et al., Column 3, Line 65 – Column 4, Line 12).

**Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11092132 to Wada in view of US 6,821,464 to Okamoto et al., as applied to Claim 1 above, and further in view of US 5,728,764 to Bauer et al.

**Regarding Claim 8.** Wada teaches the process of Claim 1 wherein quaternary ammonium salts are used (Machine Translated Detailed Description, Paragraph 16). Wada does not expressly the precursors of the ammonium compound are an amine and

alkyl halide. However, Bauer et al. also teach a process for modifying clay in which the quaternary ammonium modifier may be derived from an amine and methyl chloride (Column 3, Lines 57 – 64). Wada and Bauer et al. are analogous art as they are from the same field of endeavor, namely processes for modifying clay using quaternary ammonium compounds as organomodifiers. At the time of invention, it would have been obvious to a person of ordinary skill in the art to use the ammonium compound taught by Bauer et al. as the quaternary ammonium organomodifier in the process taught by Wada. The motivation would have been that the quaternary ammonium compounds taught by Bauer et al. can be used to modify clay such that a desired degree of hydrophobicity in the clay is attained (Bauer et al., Column 4, Lines 26 – 29).

**Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 11092132 to Wada in view of US 6,821,464 to Okamoto et al., as applied to Claim 1 above, and further in view of US 5,654,347 to Khemani et al.

**Regarding Claim 10.** Wada teaches the process of Claim 1 but do not expressly teach the modified clay produced is incorporated into a polyester foam with a regular, fine, and closed cell structure. However, Khemani et al. teach a polyester foam whose properties may be modified with the addition of clay (Column 4, Lines 30 – 33). Polyesters contain potentially hydrolysable ester bonds that give them biodegradability.

The final polyester foam product has a well formed cell structure where all cells are closed cells with a diameter between 200 – 400  $\mu\text{m}$  (Column 7, Line 60 – Column 8, Line 3). Wada and Khemani et al. are analogous art as they are from the same field of endeavor, namely compositions containing clay. At the time of invention, it would have been obvious to a person of ordinary skill in the art to incorporate the modified clay taught by Wada into a polyester foam with the cell structure taught by Khemani et al. The motivation would have been that the incorporation of clay into foam would enhance the properties, such as thermal stability and mechanical strength, in the final foam product and that modified clay has enhanced miscibility with polymers compared to unmodified clays.

### ***Response to Arguments***

Applicant's arguments with respect to Claim 1 – 10, specifically regarding the use of water in the process taught by Wada, have been considered but are moot in view of the new ground(s) of rejection.

Additionally applicant's arguments that the present invention attempts to overcome all limitations of the wet process of the prior art have been fully considered but they are not persuasive. Though understanding the claim language may be aided by explanations contained in the written description, it is important not to import into a

claim limitations that are not part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment. *Superguide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870,875, 69 USPQ2d 1865, 1868 (Fed. Cir. 2004) (MPEP 2111.01) Though the instant amended claims require that water be absent, they do not preclude the use of other solvents in the process.

### *Correspondence*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MELISSA WINKLER whose telephone number is (571)270-3305. The examiner can normally be reached on Monday - Friday 7:30AM - 5PM E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on (571)272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo, Ph.D./  
Supervisory Patent Examiner, Art Unit 1796  
15-Sep-08

MW  
September 10, 2008